UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/753,240	12/31/2000	Sherrill E. Lavagnino	102310-00115/ C00-069	8613

23459 7590 03/29/2004

ARTHUR J. O'DEA
LEGAL DEPARTMENT
COGNEX CORPORATION
ONE VISION DRIVE
NATICK, MA 01760-2077

EXAMINER	
TABATABAI, ABOLFAZL	
ART UNIT	**PAPER NUMBER**
2625	7

DATE MAILED: 03/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/753,240	LAVAGNINO ET AL.	
	Examiner	Art Unit	
	Abolfazl Tabatabai	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 December 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18 and 28-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *17 and 18* is/are allowed.

6)☐ Claim(s) *1-6, 8-16 and 28-36* is/are rejected.

7)☐ Claim(s) *7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 December 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claims 1, 3, 7, 8, 12, 17, 28-31 and 35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In line 1 of claim 1 the phrase "an image (" first image")"; line 5, the phrase "a value ("defocused value")"; line 8, the phrase " a result ("first neighborhood threshold result")"; line 12, the phrase " a result ("second neighborhood threshold result")"; lacks antecedent basis and ambiguous because it is unclear what feature or element is further limited by the above language.

In line 2, of claim 3 the phrase " an image (" threshold image")" lacks antecedent basis and ambiguous because it is unclear what feature or element is further limited by the above language.

In line 3, of claim 7 the phrase " the filter ("new pixel value")"; line 12, the phrase "a result ("new down-sum")"; line 21, the phrase "a result ("new cross-sum")" lacks antecedent basis and ambiguous because it is unclear what feature or element is further limited by the above language.

In line 1 of claim 8 the phrase "an image (" first image")"; line 3, the phrase "the first image ("first image pixels"); line 5, the phrase "a value ("defocused value")"; line 8, the phrase " a result ("first neighborhood threshold result")"; line 12, the phrase " a result

("group threshold result")" lacks antecedent basis and ambiguous because it is unclear what feature or element is further limited by the above language.

In line 2, of claim 12 the phrase " an image (" threshold image")" lacks antecedent basis and ambiguous because it is unclear what feature or element is further limited by the above language.

In line 1 of claim 17 the phrase "an image (" first image")"; line 4, the phrase "the filter ("new pixel value")"; line 13, the phrase " a result ("new down-sum")"; line 22, the phrase " a result ("new cross-sum")" lacks antecedent basis and ambiguous because it is unclear what feature or element is further limited by the above language.

In line 3 of claim 28 the phrase " a result ("first neighborhood threshold results")" lacks antecedent basis and ambiguous because it is unclear what feature or element is further limited by the above language.

In line 3 of claim 29 the phrase " a result ("second neighborhood threshold result")" lacks antecedent basis and ambiguous because it is unclear what feature or element is further limited by the above language.

In line 2 of claim 30 the phrase " an output image (" threshold image")" lacks antecedent basis and ambiguous because it is unclear what feature or element is further limited by the above language.

In line 5, of claim 31 the phrase " the first image (" first image pixels")" and "a value ("defocused value")"; line 8, the phrase "a result (neighborhood threshold result")" lacks antecedent basis and ambiguous because it is unclear what feature or element is further limited by the above language.

In line 2, of claim 35 the phrase " an image (" threshold image")" lacks antecedent basis and ambiguous because it is unclear what feature or element is further limited by the above language.

Claims 2, 4, 5, 6, 9, 10, 11, 13-16, 18, 32-34 and 36 dependent from claims 1, 7, 8, 12, 17, 31 and 35, respectively.

2. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not). Misnumbered claims 19-27 been renumbered 19-36.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-6, 8-16 and 28-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Csipkes et al (U S 5,543,915) in view of Peters et al (U S 5,077,806).

Regarding claim 1, Csipkes discloses autofocusing system for positioning an interferometric fringe over a target in an image comprising:

for each of at least selected neighborhoods of plural pixels in the first image ("first image pixels") (column 18, lines 52-67 and column 19, lines 1-5);

generating a value ("defocused value") that is a statistical function of values of the plural pixels in that neighborhood (column 3, lines 4-17; column 18, lines 52-67; column 19, lines 1-5 and column 22, lines 25-35).

However, Csipkes is silent about the specific details regarding the steps of:

comparing that defocused value with one or more first thresholds and generating, based on that comparison, a result ("first neighborhood threshold -result") for that neighborhood, wherein the one or more f5ist thresholds are held constant for all neighborhoods,

comparing that defocused value with one or more second thresholds and generating, based on that comparison, a result (" second neighborhood threshold result") for that neighborhood, and wherein the one or more second thresholds vary in accord with a region of the image in which that neighborhood is located.

In the same field of endeavor, however, Peters disclose machine vision analysis system comprising:

comparing that defocused value with one or more first thresholds and generating, based on that comparison, a result ("first neighborhood threshold -result") for that neighborhood, wherein the one or more f5ist thresholds are held constant for all neighborhoods (column 5, lines 38-55); and,

comparing that defocused value with one or more second thresholds and generating, based on that comparison, a result (" second neighborhood threshold

result") for that neighborhood, and wherein the one or more second thresholds vary in accord with a region of the image in which that neighborhood is located (column 5, lines 38-55).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use comparison for the first neighborhood threshold result and second neighborhood threshold result as taught by the Peters in the system of Csipkes because Peters provides Csipkes an improved system for machine vision analysis which may be used to inspect the image of an object to determine if the object fulfills specified criteria, and where it is assumed in practice that if the image satisfies the representative criteria, the object satisfies the actual physical requirements of which the criteria are representative and also the aforementioned type which includes the capability of having two video cameras and handling two input video signals.

Regarding claim 2, Csipkes discloses autofocusing system for positioning an interferometric fringe over a target in an image, comprising the further improvement wherein the generating step includes generating each defocused value as an average of the values of the plural pixels in the respective neighborhood (column 18, lines 52-54).

Regarding claim 3, Csipkes discloses autofocusing system for positioning an interferometric fringe over a target in an image, wherein the further improvement comprising generating an image ("threshold image") compri6iiag any of the first and second neighborhood threshold results (column 14, lines 35-49).

Claim 4 is similarly analyzed as claim 1 above.

Regarding claim 5, Csipkes discloses autofocusing system for positioning an interferometric fringe over a target in an image, comprising the further improvement wherein the step of generating the defocused value includes maintaining running averages of columns of pixels from the first image (column 18, lines 52-67).

Regarding claim 6, Csipkes discloses autofocusing system for positioning an interferometric fringe over a target in an image, comprising the further improvement wherein sizes and shapes of the neighborhoods vary along the image (column 9, lines 7-11).

Claim 8 is similarly analyzed as claim 1 above.

Regarding claim 9, Csipkes is silent about the specific details regarding the step of the improvement wherein the one or more thresholds are held constant for all groups of first image pixels.

In the same field of endeavor, however, Peters disclose machine vision analysis system comprising the step of:

the improvement wherein the one or more thresholds are held constant for all groups of first image pixels (column 3, lines 45-52).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the improvement as taught by the Peters in the system of Csipkes because Peters provides Csipkes an improved system for machine vision analysis which may be used to inspect the image of an object to determine if the object fulfills specified criteria, and where it is assumed in practice that if the image satisfies the representative criteria, the object satisfies the actual physical requirements of which

the criteria are representative and also the aforementioned type which includes the capability of having two video cameras and handling two input video signals.

Regarding claim 10, Csipkes is silent about the specific details regarding the step of the improvement wherein the one or more thresholds used with at least one group of first image pixels varies from the one or more thresholds used with at least one other group of first image pixels.

In the same field of endeavor, however, Peters disclose machine vision analysis system comprising the step of:

the improvement wher6n the one or more thresholds used with at 15ast one group of first image pixels varies from the one or more thresholds used with at least one other group of first image pixels (column 4, lines 53-60).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use pixels varies as taught by the Peters in the system of Csipkes because Peters provides Csipkes an improved system for machine vision analysis which may be used to inspect the image of an object to determine if the object fulfills specified criteria, and where it is assumed in practice that if the image satisfies the representative criteria, the object satisfies the actual physical requirements of which the criteria are representative and also the aforementioned type which includes the capability of having two video cameras and handling two input video signals.

Regarding claim 11, Csipkes discloses autofocusing system for positioning an interferometric fringe over a target in an image, comprising the improvement wherein

the one or more thresholds am a function of values of plural pixels in a region that includes a plurality of groups of first image pixels (column 18, lines 52-57)

Regarding claim 12, Csipkes discloses autofocusing system for positioning an interferometric fringe over a target in an image, wherein the further improvement comprising generating an image ("threshold image") comprising the group threshold results for a plurality of groups of the first image (column 9, lines 56-65).

Regarding claim 13, Csipkes discloses autofocusing system for positioning an interferometric fringe over a target in an image, wherein the further improvement comprising positioning the group threshold results in the threshold image based on a position of the corresponding groups in the first image (column 22, lines 53-63).

Regarding claim 14, Csipkes discloses auto focusing system for positioning an interferometric fringe over a target in an image, wherein the further improvement wherein the step of generating the defocused value includes maintaining running averages of columns of pixels from the first image (column 9, lines 7-11).

Regarding claim 15, Csipkes discloses autofocusing system for positioning an interferometric fringe over a target in an image, wherein the further improvement wherein each of the selected groups comprise neighboring pixels (column 18, lines 52-54).

Regarding claim 16, Csipkes discloses autofocusing system for positioning an interferometric fringe over a target in an image, wherein the further improvement wherein the generating step includes generating the defocused value as an average of the values of the plural pixels in the respective group (column 18, lines 52-57).

Claim 28 is similarly analyzed as claim 9 above.

Claim 29 is similarly analyzed as claim 10 above.

Regarding claim 30, Csipkes discloses autofocusing system for positioning an interferometric fringe over a target in an image, wherein the further improvement comprising logic that generates an output image ("threshold image") comprising any of the first and second neighborhood threshold results (column 9, lines 55-64).

Claim 31 is similarly analyzed as claim 1 above.

Claim 32 is similarly analyzed as claim 9 above.

Claim 33 is similarly analyzed as claim 10 above.

Claim 34 is similarly analyzed as claim 1 above.

Claim 35 is similarly analyzed as claim 1 above.

Regarding claim 36, Csipkes discloses autofocusing system for positioning an interferometric fringe over a target in an image, wherein the further improvement comprising concurrently displaying the first image and threshold images in order to facilitate operator evaluation of an object imaged thereby (column 9, lines 55-59).

Allowable Subject Matter

5. Claim 7, would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

6. Claims 17, 18 and 28-30 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

Other prior art cited

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U. S. Patent (5,872,870) to Micheal is cited for machine vision methods for identifying extrema of objects in rotated reference frames.

U.S. Patent (5,850,466) to Schott is cited for golden template comparison for rotated and/or scaled images.

U.S. Patent (6,456,339 B1) to Surati ret al is cited for super-resolution display.

U.S. Patent (5,563,962) to Peters et al is cited for two-dimensional digital hysteresis filter for smoothing digital images.

Contact Information

8. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to ABOLFAZL TABATABAI whose telephone number is (703) 306-5917.

The Examiner can normally be reached on Monday through Friday from 9:30 a.m. to 7:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Mehta Bhavesh M, can be reached at (703) 308-5246. The fax phone number for organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Abolfazl Tabatabai
Patent Examiner
Group Art Unit 2625
March 15, 2004

Jayanti K. Patel
Primary Examiner